

A new squat lobster of the genus *Munidopsis* Whiteaves, 1874 (Crustacea: Decapoda: Galatheidae) from Taiwan

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Abstract.—A new species of the squat lobster of the genus *Munidopsis* Whiteaves, *M. formosa*, is described from deep-water off the northeastern coast of Taiwan. The new species is most similar to *M. camelus* Ortmann, but differs in having a much broader and less curved rostrum, the posterior carapace ridge generally armed with a pair of submedian spines, only the chelipeds bearing epipods, and having a lighter coloration. The relationships of this new species with some other similar species are also discussed.

There are about 150 known species of *Munidopsis* Whiteaves, 1874 (see Baba 1988), most of which inhabit deep waters (to 5330 m deep) and generally have small eyes as well as a triangular rostrum. To date, only three species, namely *M. andamanica* MacGilchrist, 1905, *M. cylindrophthalma* (Alcock, 1894) and *M. latimana* Miyake & Baba, 1966, of this genus have been reported from Taiwan (Wu et al. 1998). Recently, several specimens of an undescribed species of *Munidopsis* from Taiwan were collected off the northeastern coast at a depth of about 500 m. Careful examinations of these specimens showed that they are most similar to *M. camelus* Ortmann, 1892 from Japan, and differ from other members of the genus in the rostrum being trifold, as well as the second and the third abdominal tergites each armed only with a pair of large submedian spines. Detailed comparison with *M. camelus* revealed several slight but constant differences between the Taiwanese and Japanese material. The Taiwanese specimens represent a new species described herein.

Specimens of the new species are deposited in the National Taiwan Ocean University, Keelung (NTOU), and those used of *M. camelus* in the personal collection of Prof. K. Baba, Kumamoto University, Ja-

pan (KB). The measurements given are of carapace length (cl) excluding rostrum.

Munidopsis formosa, new species.

Figs. 1a, c–e, 2a, c, d, 3

Material examined.—Holotype: Taiwan, northeastern coast, Tai-Shi fishing port, I-Lan County, commercial trawlers, about 500 m, soft bottoms, Aug 1998, 1 ♂, cl 20.4 mm (NTOU-H 1998-08).

Paratypes: Taiwan, northeastern coast, Tai-Shi fishing port, I-Lan County, commercial trawlers, about 500 m, soft bottoms, Apr 1997, 1 ♂, cl 27.8 mm (NTOU-P 1997-04); 15 May 1998, 1 ♂, cl 25.3 mm, 1 ovigerous ♀, cl 22.5 mm (NTOU-P 1998-05-15); 28 Apr 1999, 1 ovigerous ♀, cl 17.4 mm (NTOU-P 1999-04-28).

Description.—Body entirely covered with fine short setae. Rostrum broad, about 2.5 times as long as wide and $\frac{1}{3}$ as long as carapace; more or less horizontal, with tip gently curving dorsad; carinate dorsally, with trifold tip. Carapace (Figs. 1a, 2a) slightly longer than wide; frontal margin with 1 spine between rostrum and anterolateral spines; lateral margin feebly convex, armed with 4 stout spines (including anterolateral spine) at distal half; 1 pair of epigastric spines present; gastric region moderately convex, bearing row of 1–3 longi-

tudinal spines; cervical region moderately excavated; cardiac region raised, bearing large median spine; posterior transverse ridge elevated and generally armed only with pair of large submedian spines.

Abdomen (Fig. 1a) with second and third tergites each having pair of large submedian spines. Telson (Fig. 2d) subdivided into 10 plates; lateral margins fringed with dense setae (very thick in male), posterior margin with plumose setae.

Eyes small, lacking dark pigments, movable, extending to about middle of rostrum. A large spine present between eye and antenna. Basal antennular segment (Fig. 1c) bearing 2 strong distolateral spines, with distal one slightly larger. Antennal peduncle (Fig. 1d) with basal segment bearing distomesial and distolateral spines (distomesial one very strong and long), other segments spineless.

Merus of third maxilliped (Fig. 1e) longer than ischium, flexor margin bearing 3 spines, diminishing in size anteriorly, extensor margin armed with large distal spine.

Third thoracic sternite narrowing posteriorly, anterior margin concave; fourth thoracic sternite much wider, about 3 times as wide as preceding (Fig. 2c).

Chelipeds subequal, long and robust (massive in largest male), surface covered with long setae; merus long and with some large spines; carpus short, with spines mainly restricted at distal margin; palm longer than finger and without large spines (but sharply granular in the largest male); fingers not perfectly gaping, inner margins bearing some intermeshing teeth, outer margins nearly straight except at tips (that of fixed finger becoming convex in largest male).

Walking legs robust, similar, all covered with setae. First walking leg having merus with large distodorsal and distolateral spines, and some dorsal spines; carpus generally armed with 2 distodorsal spines; propodus nearly straight, more than 5 times as long as wide; dactylus much shorter than

propodus, distally curving ventrad, ventral margin minutely dentate.

Epipod present only on chelipeds.

Eggs subspherical, about 0.5 mm in diameter.

Coloration (Fig. 3).—Body pale orange to orange, with color of females generally deeper. Rostrum except tip, pale orange or whitish. Fourth or fifth abdominal segments to tailfan from pale orange to pale white posteriorly. Eyes pale orange or nearly whitish. Antennules same color as body but antennal flagella orange red. Cervical groove and cardiac depressions sometimes whitish. Ventral surface whitish except mouth parts and chelipeds pale orange.

Size.—Largest male and female cl 27.8 mm and 24.6 mm respectively. Smallest ovigerous female cl 17.4 mm.

Distribution.—So far known only from the northeastern coast of Taiwan, at depths of about 500 m.

Type locality.—Taiwan, northeastern coast.

Remarks.—The present form is closely related to *Munidopsis camelus* Ortmann, 1892 from Japan and can be readily separated from the other species of the genus by the rostrum being trifold, as well as the second and third abdominal tergites each armed with a pair of large submedian spines. Careful comparisons between *M. camelus* (1 ♂ cl 23.2 mm, 1 ♀ cl 21.5 mm, off Hayama, Sagami Bay, Japan, lobster pot, Oct 1987, H. Ikeda coll. deposited at Kumamoto University Faculty of Education; also see Miyake & Baba 1967) and the Taiwanese material revealed the following differences. The anterior three pereopods bear distinct epipods in the Japanese material but usually only the chelipeds have epipods in the Taiwanese specimens. However, in one of the Taiwanese specimens (NTOU-P 1997-04), a distinct epipod is also present on the left first walking leg. It seems that the presence or absence of epipod are not always consistent as previously thought for galatheids. Nevertheless, further differences between the Taiwanese and Jap-

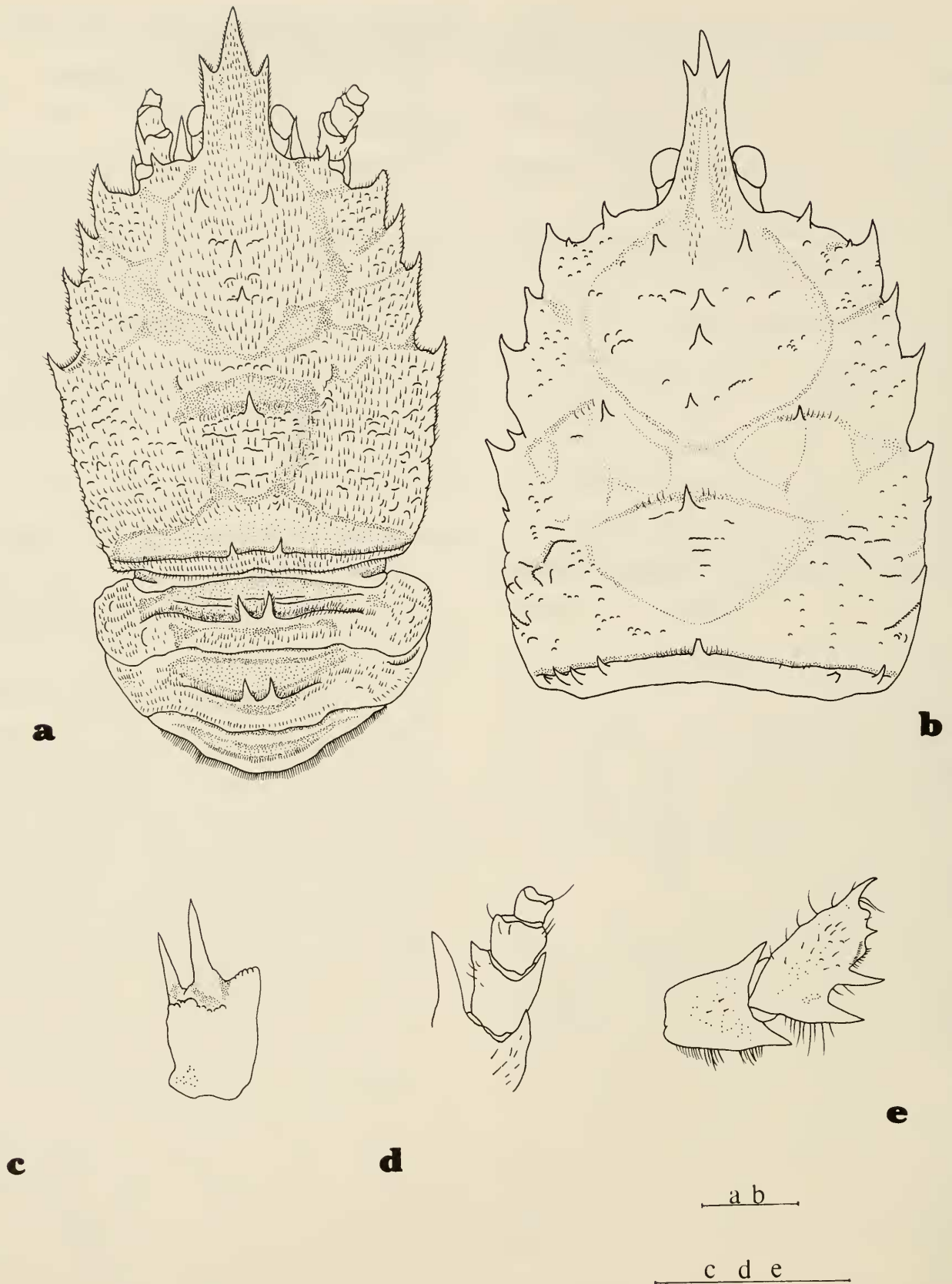


Fig. 1. a, c-e: *Munidopsis formosa*, new species, ♂ holotype cl 20.4 mm, N. E. Taiwan (NTOU-H 1998-08). b: *M. camelus* Ortmann, 1892, ♂ cl 23.2 mm, Sagami Bay, Japan (KB). a, carapace and anterior abdominal somites, dorsal view; b, carapace; c, left basal antennular segment, ventral view; d, left antennal peduncle, ventral view; e, basal segments of endopod of right maxilliped, ventral view. Scale bars = 5 mm.

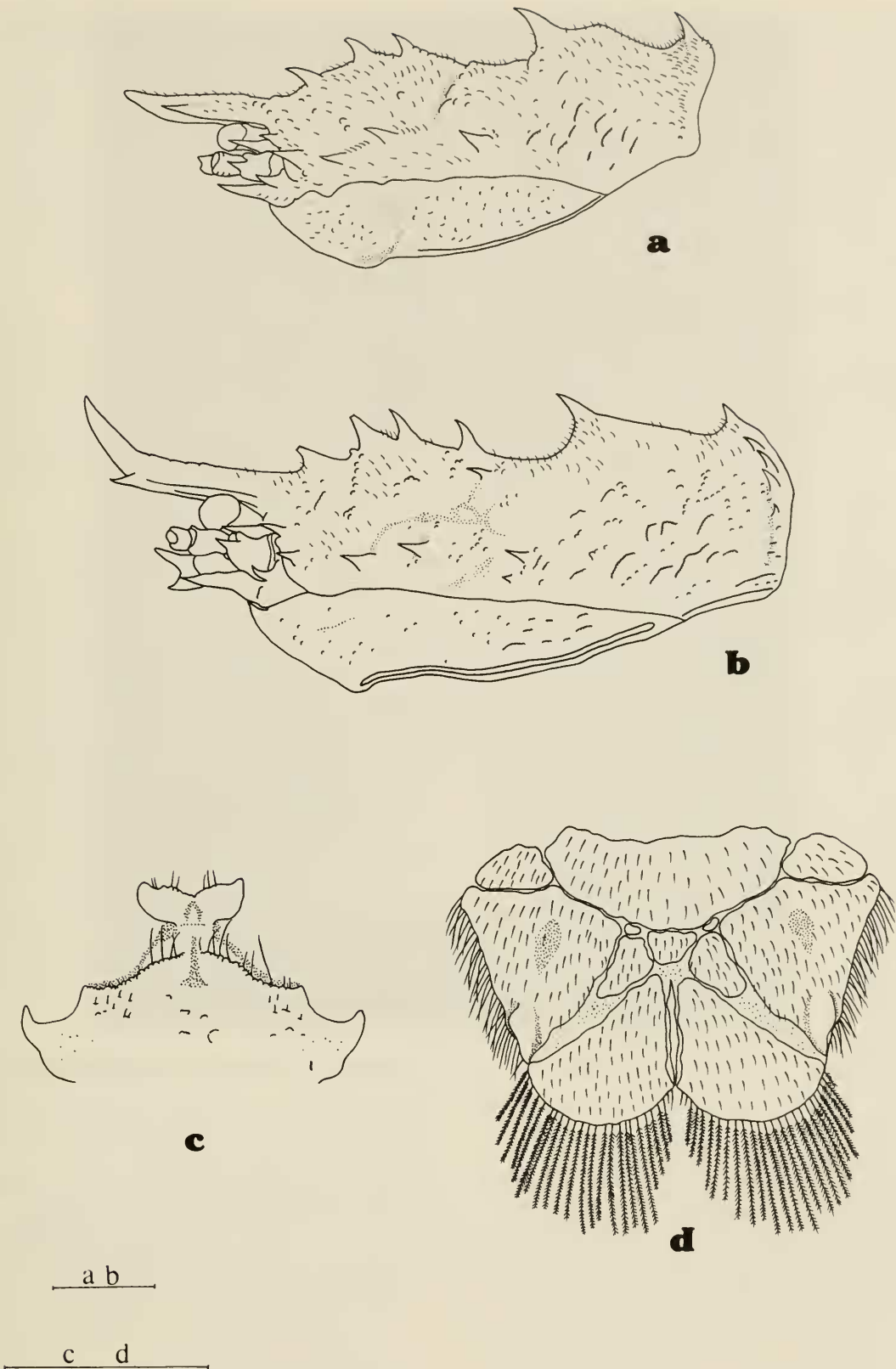


Fig. 2. a, c–d: *Munidopsis formosa*, new species, ♂ holotype cl 20.4 mm, N. E. Taiwan (NTOU-H 1998-08). b: *M. camelus* Ortmann, 1892, ♂ cl 23.2 mm, Sagami Bay, Japan (KB). a–b, carapace, lateral view; c, anterior part of thoracic sternum, ventral view; d, telson, dorsal view. Scale bar = 5 mm.

anese material can be found. The posterior carapace ridge always bear a large median spine which is accompanied with several large lateral spines in *M. camelus* (Fig. 1b).

In the Taiwanese form, the posterior carapace ridge generally armed with a pair of submedian spines only (except in one specimen, NTOU-P 1999-1-19, there is one



Fig. 3. *Munidopsis formosa*, new species, ovigerous ♀ paratype cl 22.5 mm, N. E. Taiwan (NTOU-P 1998-05-15).

more small spine present between the large submedian spines) with the lateral parts always devoid of spines (Fig. 1a). Moreover, the rostrum is distinctly narrower (near 4 times as long as wide) and with the tip abruptly curving upward in the Japanese material (Fig. 2b). The rostrum in the Taiwanese form, however, is rather broad (2.5 times as long as wide) and only gently bending upward at tip (Fig. 2a). The coloration of the Japanese material also appears to be more reddish. Color photographs of a live specimen collected off Boso Peninsula (180–250 m) showed that the body color of the Japanese material is

orange-red. All the above differences show that the Taiwanese form is distinct from *M. camelus* and it is hereby described as new.

The present new species is also similar to *M. regia* Alcock & Anderson, 1894, and *M. plumatisetigera* Baba, 1988. However, *M. formosa* new species, can be readily distinguished from *M. plumatisetigera* by the epipods on the chelipeds and the less spiny body. *M. regia* differs considerably from *M. formosa* in having a much narrower and longer rostrum, and a different spination on the abdomen. Moreover, Alcock (1901) mentioned that the color in life of *M. regia* is “chalky pink”.

Munidopsis formosa was collected from about 500 m deep. This is probably the main reason for this species being found only recently. The fishing depth of local deep-water trawlers have extended their trawling depths down to 500–600 m, and many deep-sea animals unknown to Taiwan have been collected, including the present new species.

Etymology.—This species is named after its type-locality Taiwan since it is so far only known from there. Formosa was the old name of Taiwan and is used here as a noun in apposition.

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Literature Cited

- Alcock, A. 1894. Natural history notes from H. M. Indian Marine Survey Steamer "Investigator," commander R. F. Hoskyn, R. N., commanding. Series II, no. 1. On the results of deep-sea dredging during the season 1890–91 (continued).—*Annals and Magazine of Natural History*, series 6, 13:321–334.
- . 1901. A descriptive catalogue of the India deep-sea Crustacea Decapoda, Macrura and Anomala in the Indian Museum. Being a revised account of the deep-sea species collected by the Royal Indian Marine Survey Ship Investigator. Indian Museum, Calcutta. 286 pp.
- , & A. R. S. Anderson. 1894. Natural history notes from H. M. Indian Marine Survey Steamer "Investigator", commander C. F. Oldham, R. N., Commanding. Series II, No. 14. An account of a recent collection of deep sea Crustacea from the Bay of Bengal and Laccadive Sea.—*Journal of Asiatic Society of Bengal*, 63 (II:3):141–185.
- Baba, K. 1988. Chirostylid and Galatheid Crustacean (Decapoda: Anomura) of the "Albatross" Philippine Expedition, 1907–1910.—*Researches on Crustacea*, spec. no. 2:1–203.
- MacGilchrist, A. C. 1905. Natural history notes from the R. I. M. S. "Investigator". Capt. T. H. Heming, R. N. (retired), commanding. Series III. no. 6. An account of the new and some of the rarer decapod Crustacea obtained during the surveying seasons 1901–1904.—*Annals and Magazine of Natural History*, series 7, 15:233–268.
- Miyake, S., & K. Baba. 1966. Two new species of the family Galatheididae from the Tosa Bay, Japan.—*Journal of the Faculty of Agriculture, Kyushu University, Fukuoka* 14(1):81–88.
- , & ———. 1967. New and rare species of the family Galatheididae (Crustacea, Anomura) from the Sagami Bay in the collection of the biological Laboratory, Imperial Household, Japan.—*Journal of the Faculty of Agriculture, Kyushu University* 14(2):213–224.
- Ortmann, A. 1892. Die Decapoden-Krebse des Strassburger Museums. IV. Die Abtheilungen Galatheididae und Paguridea.—*Zoologischen Jahrbuchern, Abtheilung für Systematik, Geographie und Biologie der Tiere*, 6:241–326.
- Whiteaves, J. F. 1874. On the recent deep-sea dredging operations in the Gulf of St. Lawrence.—*American Journal of Science* (3)7:210–219.
- Wu, M. F., T. Y. Chan, & H. P. Yu. 1998. On the Chirostylidae and Galatheididae (Crustacea: Decapoda: Anomura) of Taiwan.—*Annual of Taiwan Museum* 40:75–153. [In Chinese, with English abstract]